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भाग 1 प्रस्तावना स्तर

Indian Standard

INDUSTRIAL WATER TUBE BOILERS — SUPPLIER'S DATA SHEET

PART 1 PROPOSAL STAGE

UDC 621·181·2

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

August 1992 **Price Group 4**

Boilers Sectional Committee, HMD 01

FOREWORD

This Indian Standard (Part 1) was adopted by the Bureau of Indian Standards, after the draft finalized by the Boilers Sectional Committee had been approved by the Heavy Mechanical Engineering Division Council.

This information given by a manufacturer or a supplier according to this data sheet will help a purchaser to evaluate the product before he finally decides to purchase a particular brand or type. Control systems are not covered in this standard.

This Indian Standard (Part 1) contains supplier's data sheet for industrial water tube boilers at proposal stage. Part 2 of this Indian Standard would contain supplier's data sheet for industrial water tube boilers at post order stage.

Indian Standard

INDUSTRIAL WATER TUBE BOILERS — SUPPLIER'S DATA SHEET

PART 1 PROPOSAL STAGE

1 SCOPE

Covers the technical data to be supplied by a manufacturer or a supplier of an industrial boiler to a purchaser.

2 SUPPLIER'S DATA SHEET FOR INDUSTRIAL BOILER

2.1 General Information

2.1.1 *Type of Boiler* :

2.1.2 *Maker* :

2.1.3 *Model* :

2.1.4 *Number of Boilers* :

2.1.5 *Overall Dimensions of the Unit and the Total Space Required by the Boiler As Well As Its Accessories* :

2.1.6 a) *Size of the Furnace — FW × FD × FH* :

b) *Furnace Design Pressure* :

2.1.7 *Design Code* :

3 PARAMETERS AT THE BATTERY LIMIT OF THE BOILER

3.1 Steam

3.1.1 *Maximum Continuous Rating (MCR)* : t/h

3.1.2 *Pressure* : Bar (gauge)

3.1.3 *Temperature* : °C

3.1.4 *Steam Purity* :

3.2 Feed Water

3.2.1 *Total Quantity* : t/h

3.2.2 *Pressure* : Bar (gauge)

3.2.3 *Temperature* : °C

3.3 De-superheating Spray Water

3.3.1 *Quantity for De-superheating (Max)*: t/h

3.3.2 *Spray Water Temperature* : °C

4 INSTRUMENT AIR (OIL FREE AND DRY)

4.1 Quantity : m^3/h at NTP

4.2 Pressure : Bar (gauge)

4.3 Temperature : °C

5 COOLING WATER

5.1 Quantity : t/h

5.1.1 *Pressure* : Bar (gauge)

5.1.2 *Temperature (Inlet/Outlet)*: °C

6 SERVICE AIR

6.1 Quantity : m^3/h at NTP

6.2 Pressure : Bar (gauge)

6.3 Temperature : °C

7 FUEL

7.1 Type of Fuel :

7.1.1 *Main Fuel* :

7.1.2 *Auxiliary Fuel* :

7.1.3 *Fuel for Flame Stabilisation* :

7.1.4 *Fuel for Lighting Up* :

7.2 Quantity of Fuel : t/h or
: m^3/h at NTP

7.3 Pressure : Bar (gauge)

7.4 Temperature : °C

7.5 Calorific Value of Fuel (Design) :

7.5.1 *GCV (Gross Calorific Value)* : kcal/kg or kcal/m^3 at NTP

7.5.2 *NCV (Net Calorific Value)* : kcal/kg or kcal/m^3 at NTP

8 POWER

8.1 Total Power Required at 100% MCR : kW

8.1.1 *Frequency* :

8.1.2 *Phase* :

8.2 Emergency Power Required : kW

8.2.1 *Voltage* :

8.2.2 *Frequency* :

8.2.3 *Phase* :

8.3 Power Consumed at 100% MCR :

9 BOILER PERFORMANCE

9.1 Boiler Performance Test Code:

9.2 Efficiency at MCR : %

9.2.1 *Efficiency Based on GCV/ NCV of Fuel* : %

10 TIME REQUIRED TO ATTAIN

10.1 MCR : min

10.2 50% MCR from Cold/Hot : min

10.3 100% MCR from 50% MCR: min

11 BLOWDOWN : %

12 FURNACE HEAT RELEASE RATES

12.1 Effective Protected Radiant Surface : kcal/h.m^2 of BPRS

12.2 Plan Area : kcal/h-m^2 of Plan area

12.3 Volumetric : kcal/h.m^3

13 FLUE GAS VELOCITIES THROUGH TUBE BANKS

13.1 Superheater : m/s

13.2 Boiler Bank : m/s

13.3 Economiser : m/s

13.4 Air Heater : m/s

14 CIRCULATION RATIO :

15 GROSS GENERATION OF BOILER AT MCR : t/h

16 INTERNAL CONSUMPTION OF BOILER AT MCR : t/h

17 PRESSURE DATA

17.1 Pressure in the Furnace :

17.2 Flue Gas Pressure Drops :

17.2.1 *Flue Gas Pressure Drops in Boiler Bank* : mm of WC

17.2.2 *Flue Gas Pressure Drop in Superheater I* : mm of WC

17.2.3 *Flue Gas Pressure Drop in Superheater II* : mm of WC

17.2.4 *Flue Gas Pressure Drop in Economiser* : mm of WC

17.2.5 *Flue Gas Pressure Drop in Air Heater* : mm of WC

17.2.6 *Flue Gas Pressure Drop in Dust Collector* : mm of WC

17.2.7 *Other Flue Gas Pressure Drop* : mm of WC

17.2.8 *Total Pressure Drop for the Flue Gas in the Boiler* : mm of WC

18 WATER AND STEAM

18.1 Pressure of Feed Water at Economiser Inlet : Bar (gauge)

18.2 Pressure in the Drum : Bar (gauge)

18.3 Pressure of Steam at Final SH Outlet : Bar (gauge)

19 TEMPERATURE DATA

19.1 Design Ambient Air Temperature :

20 FLUE GAS

20.1 Temperature of Flue Gas Leaving Furnace : °C

20.2 Temperature of Flue Gas Entering Eco : °C

20.3 Temperature of Flue Gas Leaving Eco : °C

20.4 Temperature of Flue Gas Leaving AH : °C

20.5 Temperature of Flue Gas at ID Fan Outlet : °C

21 BOILER CONSTRUCTION DETAILS

21.1 Steam Drum

21.1.1 *Inside Diameter* : mm

21.1.2 *Thickness for Shell* : mm

21.1.3 *Actual Thickness for Dished End* : mm

21.1.4 *Material Specification of Drum Shell and Dished Ends* :

21.2 Steam Separators :

21.2.1 *Type* :

21.2.2 *Material of Construction* :

21.3 Steam Scrubbers :

21.3.1 *Type* :

21.3.2 *Material of Construction* :

21.4 Water Drum :

21.4.1 *Internal Diameter* : mm

21.4.2 *Thickness of Shell* : mm

21.4.3 *Thickness of Dished End* : mm

21.4.4 *Material Specification of Drum Shell and Dished End* : mm

21.5 Water Wall Tubes

21.5.1 *Outside Diameter* : mm

21.5.2 *Thickness* : mm

21.5.3 *Material Specification* :

21.5.4 *Effective Projected Radiant Surface* : m^2

21.6 Boiler Bank

21.6.1 *Tube OD × Thickness* : mm × mm

21.6.2 *Total Heating Surface Area* : mm^2

21.6.3 *Material Specification* :

21.7 Super Heater

	Super Heater I	Super Heater II
21.7.1 *Type*		
21.7.2 *OD × Thickness of Tubes*	mm × mm	mm × mm
21.7.3 *Total Heating Surface Area*	m^2	m^2
21.7.4 *Material Specification*		

21.8 Economiser

21.8.1 *Type* :

21.8.2 *OD × Thickness* :

21.8.3 *Fin OD × Thickness* :

21.8.4 *Total Heating Surface Area* : m^2

21.8.5 *Material Specification* :

22 AIR HEATER

22.1 Type :

22.2 Number :

22.3 Outside Diameter × Thickness of Tubes : mm × mm

22.4 Total Heating Surface Area : m^2

22.5 Material Specification :

23 ATTEMPERATOR

23.1 Type :

23.2 Location :

23.3 Material Specification :

24 SAFETY VALVES

	Drum	Super heater
24.1 Type		
24.2 Number		
24.3 Set Pressure	Bar (gauge)	Bar (gauge)

25 DEAERATOR

25.1 Number :

25.2 Type :

25.3 Operating Pressure : Bar (gauge)

25.4 Design Pressure/Vacuum : Bar (gauge)

25.5 Temperature : °C

25.6 Oxygen Content After Deaeration : Parts/million

25.7 Minimum Steam Pressure Required at the Inlet of the Control Valve : Bar (gauge)

25.8 Effective Storage Capacity of Feed Water Tank : m^3

25.9 Material Specification for

25.9.1 *Shell for Deaerating Head* : m

25.9.2 *Dished Ends for Deaerating Head* :

25.9.3 *Shell for Storage Tank* :

25.9.4 *Dished End for Storage Tank* :

26 AIR AND GAS DUCTS

26.1 Thickness of Air Duct Plate : mm

26.2 Thickness of Flue Gas Duct Plate : mm

26.3 Material of Gas Duct :

26.4 Material of Air Duct :

27 SETTING CASING AND INSULATION

27.1 Insulation Material

27.1.1 *Density* : kg/m^3

27.1.2 *Thickness* : mm

27.2 Thickness of Cladding Material : mm

27.3 Specification for Refractory Material :

27.4 Maximum Cladding Temperature :

28 STRUCTURAL STEEL ROOFING WALKWAYS AND PLATFORMS

28.1 Minimum Width of Platform and Walkways : m

28.2 Type of Roofing Material :

28.3 Total Area of Platform and Walkways : m^2

29 CHIMNEY

29.1 Number (Design Code) :

29.2 Type :

29.3 Height : m

29.4 Diameter at Base : mm

29.5 Diameter at Top : mm

29.6 Type, Height and Thickness of Lining : mm

29.7 Type, Height and Thickness of External Insulation :

29.8 Material or Construction :

30 FORCED DRAFT FAN

30.1 Type :

30.2 Number of Fans/Boiler :

30.3 Rating (Percentage of 100%MCR) :

30.4 Capacity : m^3/s at NTP

30.5 Pressure : mm/WC

30.5.1 *Design Margin on Head* :

30.5.2 *Design Margin on Capacity* :

30.5.3 *Fan Efficiency at 100% MCR* :

30.6 Temperature : °C

30.7 Brake Horse Power Required at Shaft : kW

30.8 Fan Speed : rev/min

30.9 Type of Fan Control :

30.10 Power Consumed at 100 % MCR :

30.11 Drive Speed : rev/min

30.12 Type of Drive : Motor/Steam Turbine

30.13 Drive Rating : kW

30.14 Drive Steam Turbine

30.14.1 *Inlet Steam Pressure* : Bar (gauge)

30.14.2 *Inlet Steam Temperature* : °C

30.14.3 *Outlet Steam Pressure* : Bar (gauge)

30.14.4 *Outlet Steam Temperature*: °C

30.15 Steam Consumption at 100% MCR : kg/ht

31 INDUCED DRAFT FAN

31.1 Type :

31.2 Number of Fans/Boiler :

31.3 Rating (% of 100% MCR) :

31.4 Capacity : m^3/h at NTP

31.5 Pressure : mm of water column

31.5.1 *Design Margin on Head* :

31.5.2 *Design Margin on Capacity* :

31.5.3 *Fan Efficiency at 100% MCR* :

31.6 Temperature : °C

31.7 Brake Horse Power Required at Shaft :

31.8 Fan Speed : rev/min

31.9 Drive Rating : kW

31.10 Drive Speed : rev/min

31.11 Type of Fan Control :

31.12 Material Specification for Shaft Impeller and Liners for Fan Blades :

31.13 Type of Drive : Motor/steam Turbine

31.14 Rating of Drive : kW

32 BOILER FEED PUMPS

32.1 Number

31.1.1 *No. of Fans/Boiler* :

31.1.2 *No. of Fans Normally Working/Boiler* :

31.2 Type :

32.3 Capacity : m^3/h

32.4 Suction Pressure : Bar (gauge)

32.5 Discharge Pressure : Bar (gauge)

32.6 Pump Suction Temperature : °C

32.7 Shut Off Head : mm of WC

32.8 NPSH (Net Positive Suction Head) Required : mm of WC

32.9 Pump Speed :

32.10 Drive Motor Speed : rev/min

32.11 Driver Elec. motor Steam Turbine

32.12 Type and Number

32.13 Brake Horse Power at Shaft **kW** kW

32.14 Rating

32.15 Material Specification :

32.15.1 *Body* :

32.15.2 *Impeller* :

32.15.3 *Seal* :

33 CHEMICAL FEED SYSTEM

33.1 Chemical Used :

33.2 Number of Pumps :

33.3 Type of Pump :

33.4 Capacity of Pump :

33.5 Number of Tanks :

33.6 Capacity of Each Tank :

34 SOOT BLOWERS

34.1 Location Furnace Boiler Bank SH Economiser AH

34.2 Type

34.3 Make

34.4 Number

35 FLASH TANK

35.1 Number :

35.2 Capacity : m^2

35.3 Operating Pressure : Bar (gauge)

35.4 Design Pressure : Bar (gauge)

36 TRAVELLING GRADE

36.1 Type :

36.2 Number of Sections :

36.3 Capacity of Each Section : t/h

36.4 Drive :

36.5 Power Consumption at MCR of Boiler : kW

36.6 Rating of Motor : kW

36.7 Speed of Motor : rev/min

36.8 Grate Speed Range :

36.9 Turned Down Ratio :

36.10 Total Grate Area : m^2

37 COAL FEEDER

37.1 Location :

37.2 Type :

37.3 Number :

37.4 Capacity of Each Feeder : t/h

37.5 Type of Motor :

37.6 Power Consumption at MCR of Boiler : kW

37.7 Turned Down Range :

37.8 Motor Rating : kW

37.8.1 *Speed of the Motor* : rev/min

38 PRIMARY AIR FAN FOR PF FIRING

38.1 Type

38.1.1 *Number of Fans/Boiler* :

38.1.2 *No. Normally Working/ Boiler* :

38.1.3 *Capacity of Each Fan* : m^3/s at NTP

38.2 Pressure : mm of WC

38.2.1 *Design Margin on Head* :

38.2.2 *Design Margin on Capacity*:

38.2.3 *Fan Efficiency at 100 % MCR* :

38.3 Temperature : °C

38.4 Drive :

38.5 Power Consumption : kW

38.6 Rating of Drive : kW

38.7 Speed of Drive :

38.8 Speed of Fan :

38.9 Type of Fan Control :

39 COOLING AIR FAN

39.1 Type :

39.1.1 *Number of Fans/Boiler* :

39.1.2 *No. of Fans Normally Working/Boiler* :

39.2 Capacity of Each Fan : m^3/s at NTP

39.3 Pressure : mm of WC

39.3.1 *Design Margin on Head* :

39.3.2 *Design Margin on Capacity* :

39.3.3 *Fan Efficiency at 100% MCR* :

39.4 Temperature : °C

39.5 Drive :

39.6 Power Consumption : kW

39.7 Rating of Drive : kW

39.8 Speed of Drive : rev/min

39.9 Speed of Fan : rev/min

40 BURNER

40.1 Number

40.2 Type :

40.3 Location :

40.4 Capacity Each : kg/h

40.5 Type of Atomisation : Pressure/Air/Steam

40.6 Pressure of Atomising Air : Bar (gauge)

40.7 Pressure of Atomising Steam : Bar (gauge)

40.8 Temperature of Atomising Steam : °C

40.9 Turn Down Ratio :

41 PULVERISER

41.1 Type :

41.2 Number Per Boiler :

41.2.1 *Capacity* : t/h

41.3 Percentage of Load Taken by Each Mill : %

41.4 Maximum Feed Size : mm

41.5 Drive :

41.5.1 *Power Consumption* : kW

41.5.2 *Drive Rating* : kW

41.5.3 *Drive Speed* : rev/min

41.6 Speed of the Mill : rev/min

41.7 Outlet Product Size (% Through 150 Mesh) :

41.8 Life of Grinding Elements :

41.9 Bearing and Gear Box Sealing Arrangement :

42 HEAVY OIL SYSTEM

42.1 Pump Type

42.1.1 *Number of Pumps/Boiler* :

42.2 No. of Fans Normally Working/Boiler :

42.3 Capacity Each : l/s

42.4 Delivery Pressure : Bar (gauge)

42.5 Drive :

42.6 Number of Steam Heater :

42.7 Capacity of Heater Each :

42.8 Inlet Oil Temperature : °C

42.9 Outlet Oil Temperature : °C

42.10 Electrical Heater Rating : kW

43 LIGHT OIL SYSTEM

43.1 Pump Type

43.2 Number of Pumps/Boiler :

43.3 No. of Fans Normally Working per Boiler :

43.4 Capacity each : l/s

43.5 Delivery Pressure : Bar (gauge)

43.6 Brake Horse Power : kW

43.7 Driver Speed and Rating : kW

44 MECHANICAL DUST SEPARATOR

44.1 Type :

44.2 Overall Dimensions :

44.3 Material of Cyclone Tubes :

44.4 OD × Thickness of Tubes : mm

44.5 Efficiency : %

44.6 Dust Concentration Before Separator :

44.7 Dust Concentration After Separator :

45 ELECTROSTATIC DUST PRECIPITATOR

45.1 Number of Fields :

45.2 Total Collecting Area : $m^2/m^3/s$

45.2.1 *Specific Collecting Area (TCE)* :

45.3 Collector Rapping Equipment :

45.4 Make :

45.5 Type :

45.6 Number :

45.7 Thickness of Casing and Hopper Plate :

45.8 Total Hopper Storage Capacity : Number of hours at MCR

45.9 Electrical Energy Consumed for Hopper Heating : kW

46 BUS SECTION

46.1 Number per Precipitator :

46.2 Ratio of Bus Section to Gas Quantity :

46.3 Treatment Time :

46.4 Dust Concentration Before ESP :

46.5 Dust Concentration After ESP :

46.6 Height of Hopper Outlet from Ground Level : mm

NOTE — If the supplier wants to include any special item which is not included above, a separate sheet may be attached for the same.

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BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75
Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices :	Telephone
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	331 01 31 331 13 75
Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola CALCUTTA 700054	37 84 99, 37 85 61, 37 86 26, 37 86 62
Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036	53 38 43, 53 16 40, 53 23 84
Southern : C. I. T. Campus, IV Cross Road, MADRAS 600113	235 02 16, 235 04 42, 235 15 19, 235 23 15
Western : Manakalaya, E9 MIDC, Marol, Andheri (East) BOMBAY 400093	632 92 95, 632 78 58, 632 78 91, 632 78 92

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